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Measuring Global Production: Goods sent abroad for processing and merchanting [Part of Chapter 5]

Prepared by Task Force on Global Production

Summary

The document is an extract from the draft "Guide to measuring global production", bringing together the measurement challenges of goods sent abroad for processing and merchanting. This document systematically reviews the data items needed to account for all aspects of these global production arrangements: production and international trade flows. It also reviews all possible data sources that may support their recording.

The Guide was developed by a Task Force to assist national accounts and balance of payments compilers with recording global production related activities in their accounts. The Task Force is chaired by Ireland and the guide has been edited by the Netherlands.

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I. Introduction

1. This paper focusses primarily on the measurement challenges related to the first three categories of global production as introduced in Chapter 2 of the Guide: Goods sent abroad for processing (case A in Table 1) and Merchanting. Factoryless goods manufacturing (C) is discussed in a separate paper. These challenges become particularly apparent in the context of the changed accounting conventions, the 1993 and 2008 versions of the System of National Accounts (SNA), and the fifth and sixth versions of the Balance of Payments (BPM) Manual. This calls for a review of the data collection methods and the data analysis.

2. Attention is given to the changing accounting conventions between the 1993 and 2008 versions of the SNA, and differences between the fifth and sixth versions of the BPM, particularly with respect to the data needs and analysis required for each of these three forms of global production. The conceptual underpinnings of these changes are explained in the Globalization Guide. The changing concepts are generally well understood, while the required modifications in data collection are not always straightforward. The International Merchandise Trade Statistics (IMTS 2010) have a different conceptual basis and their reconciliation with the imports and exports as recorded in the national accounts and the balance of payment requires several steps (see Table 2 in the BPM6).

3. However, the data items needed to make these adjustments may not be readily available, so these deserve further attention. Without guidance there is concern that national statistical institutes (NSIs) and other compiling agencies will employ approaches that are different enough to hamper international comparability of national accounts and balance of payments statistics. However, it is acknowledged that compilers will use different methods depending on the specific characteristics of institutional arrangements and statistical systems in their countries.

4. This chapter follows a step-by-step approach by reviewing the data items needed to measure outward processing, inward processing (in Section 5.2 of the Guide to Measuring Global Production), merchanting (5.3) and factoryless goods production (5.4) properly. This guidance is not only limited to the recording of international trade flows but also addresses some aspects of measuring production such as the recording of output, intermediate consumption and inventories.

5. Available data sources may be incomplete, or may be found insufficiently reliable to carry out some of the steps needed to obtain the required estimates. Section 5.5 provides a list of existing and relevant data sources and suggests how relatively small adjustments in these source statistics may leverage their use in measuring certain aspects of global production and improve the quality of the estimates. This information may help to assess additional data needs against all current and potential sources of information with a view to minimize collection cost and response burden.

6. This paper benefits substantially from the work carried out by the Eurostat Task Force on 'Goods sent abroad for processing' and the related manual that was compiled as a follow up of the task force report. However, it reflects the experiences from a broad range of countries including Canada, China, European Union (EU) member states, Israel, Ireland, Kyrgyzstan, Mexico and the United States.

II. Goods sent abroad for processing (A)

A. Outward processing

7. The name 'outward processing' is used to address the situation in which a resident company, the principal, sends goods abroad for processing while retaining economic ownership of these goods. After processing the goods may be sent back to the company, or to customers that are resident in the country. However, it is also possible that after processing the goods do not return and are directly delivered to customers in the country where the processing takes place or yet another country.

8. The conceptual differences between the 1993 and 2008 versions of the SNA of recording goods sent abroad for processing are explained in detail in the Globalization Guide (Chapter 5). Under the 1993 SNA treatment, an ownership change value is imputed for the raw materials or semi-processed goods sent abroad for processing, as an export of goods. After processing a second transaction is imputed exposing the import of the manufactured good in a similar way. This imputation of processing related imports and exports is not required in the 2008 SNA as their recording should be fully based on the observation of international product transactions. The main transaction taking place in the context of outward processing is the fee paid for the delivery of processing services.

1. Measuring production

9. Conceptually, moving from 1993 to 2008 SNA leads to a number of changes in the production accounts of companies that send goods abroad for processing. These changes are reflected in Table 1 which turns back to the athletics shoe example as introduced in Chapter 2 of the Guide. The table shows that according to the 1993 SNA, output needed to be upwardly adjusted to include the delivery of goods sent abroad for processing. Similarly, intermediate consumption is increased by the imputed purchase of processed goods. As long as the difference between imputed output (30) and imputed intermediate consumption (50) represents the processing fee, the 1993 and 2008 SNA recommendations lead to the same value added.

10. One may expect that, not many national accountants were able to follow the 1993 SNA recommendations to accurately make such ownership imputation adjustments in the production account. However, there were cases where NSIs brought production and intermediate consumption carefully in line with international trade statistics as reported by a limited number of companies engaged in outward or inward processing and other adjustments. Without such adjustments, the balancing of supply-use tables were disturbed by the (implicit) mix up of different recording concepts. This is one of the reasons why these accounting recommendations were changed in the 2008 SNA, as it is expected to improve the internal consistency of the national accounts.

Table 1
Outward processing, the production account according to 1993 and 2008 SNA

	SNA 1993	*SNA 2008*
Output	**140 (=110+30)**	**110**
Goods	115 (=85+30)	85
Services	25	25
Intermediate consumption	**87 (=37+50)**	**57**
Materials	80 (=30+50)	30
Processing services	0	20
Other services	7	7
Value added	**53**	**53**
Compensation of employees	17	17
Gross operating surplus	36	36

11. Another consequence of the 1993 SNA recording method of outward processing was that the purchase of processing services (20) was not separately recorded, since this fee is assumed to be included in the value of the return flow of the good after processing.

12. One may conclude that in the case of outward processing the 2008 SNA guidelines lead to simplification of the recording of production. The accounts can be constructed straightforwardly by following the transactions as reported in business surveys, without the need of making imputations. However, this entails and effort to bring trade flows in line with the reality of manufacturing.

13. Regarding the correct observation of outward processing, it is recommended to explicitly include in the questionnaires of business surveys a data item on purchases of manufacturing services. Further, a distinction should be made between services purchased from domestic suppliers and from suppliers abroad. It can be that the wording associated with industrial processing (sometimes addressed as custom work) is cumbersome and possibly not clear to respondents and might benefit therefore from a review.

14. Further, outward processing may lead to inventories of raw materials or processed goods that are under ownership of the principal but have a physical presence in the country of the processor. It is recommended that the instructions in business surveys highlight explicitly that also inventories held abroad must be reported. Of course, adding a separate question in the questionnaire on inventories held abroad would be particularly helpful.

15. Keeping in mind that not all firms are engaged in outward industrial processing, there should be an assurance that (i) the survey frame is comprehensive and includes such firms and (ii) the sample size is sufficient and with an effective sampling strategy. A priori information or company profiling can be of assistance in identifying large companies engaged in processing. Such companies would ideally be in the take-all portion of the sample. At the very least, they should be in the take-all portion of the annual survey, if such a survey is used to supplement and benchmark the monthly or quarterly surveys.

16. According to the International Standard Industrial Classification (ISIC) Rev.4 the principal is classified to the class that corresponds to the activity representing the complete production process, i.e., it is classified as if it were carrying out the complete process, including the contracted work, itself. For national accounting purposes it may be useful to head these companies, engaged in substantive outward processing, under a separate

subcategory. This may be important for compilation reasons as well as for analytical reasons, as the cost structure of such companies may differ substantially from companies that carry out the physical transformation themselves.

2. Measuring international trade in goods and manufacturing services

17. Table 2 exposes the international transactions in the simplest case of outward processing in which the goods after processing re-enter the country of the owner. As illustrated in table, the required changes in the recording of international transactions logically follow those made in the production account. In the 2008 SNA the imputation of export and import flows is no longer required. The only transaction that needs recording is the processing fee paid to the processor abroad. One key measurement challenge is the adjustments that must be made in the merchandise trade statistics for their incorporation in the national accounts and balance of payments. Another challenge poses the situation in which the processed goods do not return to the country of the principal. Both measurement issues are further discussed below.

Table 2
Outward processing, international transactions according to 1993 and 2008 SNA

	SNA 1993	*SNA 2008*
Exports	**30**	**0**
Goods	30	0
Manufacturing services	0	0
Imports	**50**	**20**
Goods	50	0
Manufacturing services	0	20

18. Practically each national accounts, or balance of payments, compiler will use the International Merchandise Trade Statistics (IMTS) 2010 data collection framework as a starting point for the estimation of imports and exports of goods in national accounts and balance of payments. Like previous editions, IMTS 2010 gives priority to the need for statistics that reflect physical cross-border movements of goods. This recording concept of cross-border flows differs in several important aspects from the conceptual framework adopted in the 2008 SNA and BPM6, which is the recording of imports and exports purely on transaction basis.

19. In IMTS 2010 (par. 1.20) it is mentioned that all cases of goods sent for processing, and goods resulting from the processing, are to be included in the merchandise exports and imports of the countries at their full (gross) value. As these shipments of goods do not coincide with economic transactions they should not be recorded as imports or exports in the national accounts or the balance of payments. Essentially, goods for processing (where there is no change of ownership) need to be separately identified so that they can be removed from the IMTS source data, before they are integrated in the national accounts or balance of payments. The options to make such adjustments in a sufficiently robust way may differ from country to country.

20. More generally, in the context of outward processing the following data items, and corresponding data adjustments, are required:

(a) Adjustments in IMTS to remove (i) the merchandise trade exports for the goods being sent abroad for processing and (ii) to remove the merchandise trade imports for the goods being returned to the domestic economy following processing;

(b) In case the processed goods are purchased abroad, include a recording of these imports of raw materials or semi-processed goods;

(c) Estimate export of processed goods, in case these do not physically return to the country of the principal;

(d) Estimate the import of services associated with the purchase of processing services from abroad;

(e) Estimate (changes in) inventories held abroad in connection to outward processing.

21. Each of these items is further discussed below.

A. Adjustments in merchandise trade statistics

22. In many countries customs information form the basis of merchandise trade statistics. As mentioned these need to be translated to national accounts and balance of payments concepts. The adjustments can include coverage, timing, valuation and country attribution (origin-shipment) adjustments, but also adjustments needed to record international trade on a change of ownership basis for goods under processing arrangements (or goods under repair).

23. Some or most of the merchandise subject to processing may qualify for exemptions from normal customs duties (exempt or partially exempt). Under these circumstances, it is expected that customs' records would identify such merchandise. For example, information on re-exports may be widely available in the customs information. It is quite possible in some countries that available customs information is not fully utilized in the merchandise trade statistics. Some of this information may already exist on available customs fields that are not fully captured or ignored for merchandise trade statistics purposes. In other words, existing but non-tabulated or analysed fields might be able to provide important information for adjustment purposes. This might involve additional efforts by compilers as well as negotiations with customs agencies for access to additional records on customs documents.

24. The desired additional information from customs records would include the values and commodity codes of the merchandise that has been sent abroad for processing, the processing fees paid on these goods, where the work is undertaken and where the processed goods are destined, etc. The information may also include the dates of departure and return of all temporarily shipped merchandise.

25. The commodity detail that would be associated with any of these categories of temporarily shipped merchandise would then form the basis of a national accounts or balance of payments change in ownership adjustment for trade in goods. Exports related to outward processing would have to be removed in the period in which they were sent abroad as well as for the period in which they returned.

26. For example, within the EU, specific customs procedures are used to identify certain types of trade, including goods for inward and outward processing. These types of trade are identified by "nature of transaction codes" within customs procedures. While these codes are typically used to compile IMTS, the information collected can be a source of information to identify goods for processing.

27. In the context of the nature of transaction codes, outward processing is defined as the customs procedure under which goods that are in free circulation in an economy may be temporarily exported for manufacturing, processing or repair and then re-imported with total or partial exemption from import duties and taxes.

28. While such nature of transaction codes may be a useful source of information to the compiler, they do not readily identify whether there is a change of ownership or not, just that the goods are intended for re-export. However, identifying whether the goods are being returned to the domestic economy seems a reasonable proxy for determining whether there is no change of ownership.

29. The nature of transaction codes can be used as a source for detecting and extracting commodity flows subject to processing, but only when this classification is in effective use by the customs authority. If goods for processing are exempt from certain taxes, the incentives are in place to report high quality data. Without such tax breaks the quality of the obtained data may not be sufficient.

30. The EU Manual on Goods Sent Abroad for Processing recommends consulting the customs administrations regarding the quality and use of information obtained from transaction codes. As mentioned it is important to understand companies' practices with respect to the declaration of goods for processing and the suitability of actual customs records to identify them. This may require a one-off survey coordinated by custom administrations on behalf of balance of payments and national accounts compilers.

31. Alternative options need to be considered when information on nature of transaction codes of sufficient quality is not available from the merchandise trade statistics. It is possible that information on the (magnitude of) value of goods sent abroad for processing be obtained from business surveys in combination with questions on payments of processing fees to foreign processors. This information can be used to make the required adjustments in the merchandise trade statistics.

32. Obtaining these data items from business surveys may lead to increasing response burden that is considered undesirable. Under such conditions the fall back option is to make crude adjustments based on information on payments of processing fees to foreign processors as derived from business surveys and international trade in services surveys. The assumption used may be that the processing fee reflects the difference between the value of goods sent for processing and the value of goods returning to the home country of the owner. This would imply that the size of downward adjustments of exports and imports are such that the trade balance for goods reflect the service fee. As the fee is recorded separately, the overall trade balance would be unaffected.

33. A possible way to measure the unknown gross flows to be removed is through measuring the processing fees to processing goods ratios estimated for a sample of similar firms in terms of economic activity, country of origin/destination of the goods, etc. for which all this information is readily available.

34. However, such adjustments may give rise to disturbances in the trade balance, particularly when there is uncertainty about the amount of goods not returning after processing to the country of residence of the principal. Again, under such data conditions it is advised to run a one off survey to obtain at least a general picture of the importance of flows of processed goods not re-entering the domestic economy.

Country Case Study 1

International Merchandise Trade Statistics (IMTS) in the European Union

The compilation of the IMTS (named International Trade in Goods Statistics (ITGS) at the level of the European Union) relies principally on customs records complemented, as appropriate, by additional sources to enhance their coverage (e.g. to include electricity, or trade in vessels and aircrafts). These statistics essentially reflect the physical movement of goods across borders.

The IMTS in the European Union is based on two data collection systems called Intrastat and Extrastat. The European Union is a customs union and there are no customs frontiers between its Member States. The introduction of the single market on 1 January 1993 led to the abolition of customs formalities between the Member States which had served as the traditional source of trade statistics, and to a clear distinction in the observation methods and collecting systems between the intra-EU and extra-EU trade, giving existence to two observation methods, i.e. the Intrastat system and the Extrastat system.

Companies that trade within the European Union with other Member States (so-called Intrastat trade) have seen substantial changes. Detected by means of the value added tax (VAT) information, they declare directly to the statistical authorities. Companies that trade with countries outside the European Union (so-called Extrastat trade) declare, as before 1993, only to the customs authorities, and a copy of the customs documents is processed by the statistical authorities.

The Intrastat system is linked to the value added tax system, based on enterprise surveys and data according to the country of consignment for arrivals (imports) and the country of destination for dispatches (exports). Enterprises registered in the VAT register with a foreign trade turnover exceeding the statistical threshold submit Intrastat declarations. In the Intrastat declaration the information related to the country of origin is not obligatory. The reporting agent in the country of final destination may therefore not know at all the non-EU country of origin of the goods. Only the information related to the country of consignment (imports) is available.

The trade of Member States with non-member countries (Extrastat) is recorded on the basis of customs declarations (single administrative document). The Extrastat statistics collect data according to the country of origin/final destination.

Goods for processing are recorded on a gross basis in the IMTS. An export is recorded when a semi-finished good is transferred to a foreign processor for processing under contract (outward processing) and an import is recorded when a national processor receives foreign owned goods for processing (inward processing). Goods for processing can to some extent be identified in the IMTS by the nature of transaction codes or the customs procedure codes. It is mandatory for Member States to collect the nature of transaction code in Intrastat. The nature of transactions is the sum of characteristics (e.g. purchases or sales, goods sent for processing), helping to determine the different transactions in Intrastat/Extrastat. The nature of transactions is specified by a two digit code as follows:

(a) Operations with a view to processing under contract:

41. Goods expected to return to the initial Member State of dispatch;

42. Goods not expected to return to the initial Member State of dispatch.

(b) Operations following processing under contract:

51. Goods returning to the initial Member State of dispatch;

52. Goods not returning to the initial Member State of dispatch.

In Extrastat, and in the customs procedure code, it is optional for Member States to collect the nature of transaction. It is envisaged that the collection of the nature of transaction should become mandatory with the implementation of the modernized customs code in 2013. The customs procedure codes are four digit codes. The two first digits shows the current procedure while the third and fourth digit indicate the previous procedure that the goods were placed under.

Some procedures indicate goods for processing:

21, 22: Temporary export under outward processing

41: Inwards processing procedure – drawback system

51: Inwards processing procedure – suspension system

91: Processing under customs control

Some procedures can only exist as a previous procedure:

54: A previous procedure indicating that goods were under inward processing procedure in another Member State (suspension system).

92: A previous procedure indicating that goods were under processing under customs control in another Member State.

Codes 41, 51 and 91 are import procedures used by the companies (requires an authorisation) when there is a tariff on the materials that are going to be processed. The extent of goods imported for processing where the procedure for normal imports is used is unknown. Customs procedure codes 41 and 51 are used when the goods are expected to be re-exported. In case of code 51 the goods are not in free circulation of the EU ('T1 goods') and after processing the exports of the processed goods must be documented. In case of code 41 the customs duties are paid and the goods are in free circulation ('T2 goods'). When the goods are subsequently re-exported the duties are refunded. Since the goods are in free circulation the goods can without any further notification of the customs authorities stay in the processing economy even though this was not anticipated initially. Due to the re-export of the processed goods both 41 and 51 might represent processing activities under contract. Concerning customs procedure code 91 there is no requirement or intention that the goods must be re-exported following processing. Only when the goods are re-exported it seems reasonably that the goods might have been processed under contract. Only a fraction of the goods imported for processing under customs control should be associated with processing under contract. The ratio between the value of goods that are re-exported and goods that are not re-exported provides an indication of the share of imports for processing under contract. Codes 54 and 92 exist only as a previous procedure indicating that the processing activity has taken place in another Member State. Codes 21 and 22 are export procedure codes that are used when the processed goods are expected to return. When there is a tariff on the finished goods the company has an economic incentive to use the codes for processing. The amount of goods imported following processing but which are reported under the procedure for normal imports is unknown. When semi-finished goods are not expected to return after processing, the procedure for normal exports is likely to be used.

B. *Estimate purchases of goods (raw materials, semi-processed goods) abroad as imports*

35. Goods (raw materials, semi-processed goods) to be processed by a foreign processor may be purchased abroad. In such cases these purchases will not show up as imports in merchandise trade statistics as these goods do not cross the borders of the country in which the principal is resident.

36. The only way these imports are observed is asking the respondents of business surveys to report domestic purchases of intermediate goods from purchases abroad. Such a split is particularly recommended for industry branches in which outward processing is known to exist more widely. A coherent approach is to combine questions on foreign expenditure on processing services abroad (see the following item) with related imports of goods subject to outward processing.

37. In absence of information coming from business surveys a possible approximation would be to subtract the processing fee paid from the value of the imports after processing as reported in customs records. An error that could easily be made is removing imports after outward processing from merchandise trade statistics, but without replacement with the actual import value of the goods purchased abroad before processing.

C. *Estimate exports directly following processing*

38. The exports following outward processing will not show up in merchandise trade statistics either as the goods have already crossed borders before the transaction in processed goods takes place. The nature of transaction codes in merchandise trade statistics may be helpful to detect goods sent for processing that will not return to the domestic economy after processing. If this information is available, and of sufficient quality, the values of these goods sent for processing could be replaced by the eventual transaction value after processing. The best approach would be to match turnover from foreign sales (as reported by the principal in business surveys) with goods sent for processing and not returning back to the home country. A rough approximation of the transaction value would be to add the processing fee paid by the exporting principal to the commodity value at the moment it is shipped abroad for processing as reported in customs records.

39. Without information of sufficient detail and quality on the nature of transactions, adjustments in merchandise trade statistics cannot be made and are not without risk. Again, an error that could easily be made is removing shipments for outward processing from merchandise trade statistics, but without replacement with the actual export value of the good after processing.

D. *Estimate the import of processing services*

40. There are two data sources in particular that may provide information on the import of processing fees: business surveys and the international trade in services surveys. The latter source is sometimes also referred to as balance of payments surveys. Both types of surveys may not be geared to measure aspects of global production, in particular with respect to services associated with goods that cross the border for processing. However, both surveys can be amended to collect information on purchases of processing services from foreign suppliers. The Manual on Statistics of International Trade in Services 2010 (MSITS 2010, O.1.) addresses explicitly in its classification the coverage of manufacturing services on physical inputs owned by others.

41. One challenge is to ensure that surveys adequately cover firms engaged in (outward) processing. In this context, one big advantage of business surveys is that they usually cover total domestic activity while the international trade in services survey often have a smaller scope in terms of coverage and sample size. Another advantage of the business survey is obviously the integrated view in which these characteristics of production and output are obtained.

42. An alternative approach is to measure the processing fee indirectly as the difference in the values of the goods before and after processing, as observed via the export and the import flows of goods subject to an outward processing arrangement. Box III.2 in the MSITS 2010 explains that the value of the fees charged for manufacturing services on

physical inputs owned by others is not necessarily the same as the difference between the value of goods sent for processing and the value of goods after processing. In addition to the processing fee, value differences may also include holding gains and overhead costs. At the same time, such calculations become particularly problematic in case goods do not return to the country of the principal. Further, as the result of physical transformation, the product classification may change before and after processing and this may equally complicate the indirect estimation of the processing fee. Therefore it is recommended to observe the processing fee directly rather than indirectly.

E. Estimate (changes in) inventories held abroad

43. The data on inventories are usually collected as part of the business survey. It was recommended before that the design of business surveys should be such that also inventories held abroad are captured. Of course a split between domestic and foreign held inventories would be very helpful. Also a split of raw materials versus processed goods, would be useful, particularly in providing a broader picture of the commodity flows subject to outward processing. This split would also help to properly measure revaluations.

3. Data validation

44. From a theoretical point of view, it is possible to collect information on data items a-d, and to estimate each of them, independently. Many compilers will be making their estimates under less favourable conditions and therefore data validation must be part of the estimation procedure. These data validations can be done at various levels of detail.

45. Even if information on processing services is largely or solely obtained from the trade in services surveys, it is possible that the coverage of this activity in merchandise trade statistics is superior to that of services surveys. In other words the merchandise trade statistics may be used to detect omissions in the observed payments of processing fees. There should be a rough relationship between the values of commodity flows and processing fees. Data errors can be detected as well by comparing processing flows as observed from the nature of transaction codes information in merchandise trade statistics and the processing fees as observed in the trade in services statistics. Also, information from business surveys can help to validate both the coverage of processing in international trade in services and the international trade flows in customs data.

46. All of this could be enhanced by the existence of so-called 'importer-exporter' registers associated with merchandise trade statistics. The alignment of these registers with the business register would facilitate data confrontation with other surveys. Some countries have developed importer-exporter registers, which will be linking the merchandise trade by commodity to the firms engaged in this activity. Importer-exporter registers allow tracing detailed commodity trade back to the trading establishments and importer-exporter firms. This can provide valuable possibilities for linking trade data to the related business surveys, especially manufacturing surveys and trade in services surveys, in the case of cross-border processing activity. Tying the aforementioned merchandise trade adjustments to firms in manufacturing via record linkages as well as commodities can increase the accuracy and the alignment of production and trade related data of the examined firms.

47. Finally, the above discussed adjustments in IMTS focus primarily on obtaining the total exports and imports according to 2008 SNA and BPM6 principals, however, without necessarily taking into account a product breakdown. This latter aspect is particularly relevant for the compilation and balancing of supply-use tables. A product breakdown may also help to provide a correct representation of external trade in the context of global production. And even the sub-annual balance of payments and the quarterly GDP estimates usually require some degree of commodity detail.

48. Referring back to the athletic shoe example of Chapter 2 of the Guide, if a principal sends the midsoles to a foreign processor for final assembly, and the shoes do not return to the country of the principal but are shipped directly to the country of the final user, the exports of the principal, for example estimated as the sum of the value of the midsoles and the processing fee paid, have to be registered as exports of shoes and not as exports of midsoles. Classifying these exports correctly on the basis of the Central Product Classification is not straightforward. A default assumption could be to assume that the product breakdown of the goods before processing is the same after processing. This may indeed be plausible assumption on a higher aggregation level. These classification issues are equally relevant when making corrections in IMTS in connection to inward processing.

B. Inward processing

49. The name 'inward processing' is used to address the situation in which the resident company, the processor, is engaged in the physical transformation of goods that are before and after processing under ownership of a foreign principal. After processing, the goods may return to the resident country of the principal, or be supplied to customers in the same country of the processor, or shipped to yet another country.

50. Inward processing arrangements are usually easier identified and observed than outward processing because the nature of the arrangement is usually explicitly reflected in business surveys.

4. Measuring production

51. Following 2008 SNA and BPM6 recommendations, the output of the processor represents the manufacturing processing services and not the imputed ownership change values of the manufactured products, as was required according to 1993 SNA. Without the need of making these imputations, the production account can be derived straightforwardly from the revenues and costs as reported in business statistics.

52. Following up on the athletics shoes example, introduced in Chapter 2 of the Guide, the output of the processor represents the processing services (20), corresponding in this example to the compensation of employees.

53. According to ISIC Rev.4 contractors, or units carrying out an activity on a fee or contract basis, are classified in the same category as units producing the same goods or services on own account. For national accounting purposes it may be useful to present companies that mainly provide industrial services under a separate subcategory. This may be important for compilation, as well as analytical, reasons as the cost structure of contract manufacturers will substantially differ from companies carrying out production on own account.

Table 3
Inward processing, the production account according to 1993 and 2008 SNA

	SNA 1993	*SNA 2008*
Output	**50 (=30+20)**	**20**
Goods	50 (=30+20)	0
Services	0	20
Intermediate consumption	**30**	**0**
Materials	30	0
Processing services	0	0
Other services	0	0
Value added	**20**	**20**
Compensation of employees	20	20
Gross operating surplus	0	0

5. Measuring international trade

54. From the processor's country perspective, the required changes when moving from 1993 to 2008 SNA are the mirror image of the changes illustrated in Table 2. The shipments of raw materials, and possibly the processed goods, will show up in merchandise trade statistics but these should not be recorded as imports and exports in the national accounts or balance of payments of the country in which the processor is resident. So the new 2008 SNA and BPM6 guidelines require that the international trade flows related to inward processing, as reported in the IMTS source data, are removed from the import and export estimates in the national accounts and balance of payments.

55. In the context of inward processing the following data items, and corresponding data adjustments, are required:

(a) Adjust trade in goods to remove (i) the merchandise trade imports for the goods received from abroad for processing and (ii) to remove the merchandise trade exports for the goods being returned to the domestic economy following processing;

(b) Estimate the exports of services associated with the sale of processing services to abroad;

(c) If relevant, estimate the value of exports of goods (raw materials, semi-manufactured goods) purchased on the domestic market by the principal abroad, and which are subsequently processed by the domestic processor.

56. One may assume that inventories of raw materials or finished products held in the neighbourhood of the processor, but under ownership of the principal, are not reported by the processor in its business statistics. Each of these three above mentioned items are further discussed below.

A. Adjustments in merchandise trade statistics

57. As discussed in the former subsection on outward processing in the context of outward processing, nature of transaction codes similar to those used by the EU can also be used as a source for detecting and extracting commodity flows subject to inward processing, but only when this classification is in effective use by the customs authority and the incentives are in place (the existence of tax breaks) to report to the customs authorities information of sufficient quality.

58. Alternatively, information on the value of goods for inward processing can be obtained from business surveys in combination with questions on payments of processing fees by foreign principals. This information can be used to make the required adjustments in the merchandise trade statistics. But it must be stressed that the principals of processing generally have a much better view on the value of goods sent abroad for processing than the processors. The processors may not have precise information on value of the goods sent to them for processing as they are not the owners.

59. A fall back option is to assume a certain relationship between the value of processing services and the value of goods sent for processing, on the basis of which general adjustments can be made in merchandise trade statistics. Import and exports may be downwardly corrected in exactly similar way. However, such adjustments may give rise to disturbances in the trade balance, particularly when there is uncertainty about the amount of goods that remain in the country of the processor. In this situation it is advised to run at least a one off survey to obtain a general picture of the relationship between processing fees and the product flow values subject to inward processing, and to obtain a view on the significance of those flows that stay after processing in the domestic economy of the processor.

B. Estimate the export of processing services

60. There are two data sources in particular that may provide information on the export of processing services: business surveys and the international trade in services surveys. As already mentioned, both surveys can be amended to collect information on the production and export of processing services. The output of processing services of the processor is probably easier observed than the intermediate consumption of processing services in the accounts of the principal. The indirect measurement of exports of processing services as the difference in the values of the goods before and after processing is not recommended (for other reasons than data confrontation) because of the same reasons highlighted in the context of outward processing (5.2.1).

C. Exports of goods purchased on the domestic market by the principal abroad which are processed by a domestic processor

61. From the perspective of outward processing there is no obvious mode of observing these exports. Before processing no cross-border flow of goods is observed and as such these exports will remain unobserved in the merchandise trade of goods statistics. As the domestic processor is not directly involved in the transaction (the domestic purchase of raw materials) it is not obvious to burden the processor with questions about the origin of country of goods it processes (domestically purchased or shipped from abroad).

62. Alternatively, the value of the export of raw materials or semi-manufactured goods could be obtained by subtracting the processing fees from the value of the export flow after processing. The latter information may be obtained from the cross-border registration as followed in the merchandise trade statistics. A complicating factor is that only part of the processed goods is purchased by the principals in the domestic economy.

6. Data validation

63. The procedures of data validation were already discussed in the context of outward processing. The need of such procedures is equally relevant for analysing the outcomes on inward processing, particularly when the underlying source data is incomplete or not of sufficient quality.

Country Case Study 2

The effects of manufacturing services on the balance of payments of China

Thanks to the open-up policy in the late 1970's, the importance of goods for processing has increased rapidly and this contributed greatly to the development of foreign trade, employment, Gross Domestic Product (GDP) growth and industry restructuring in China. According to Monitoring Measures of General Administration of Customs of the People Republic of China on Goods under Goods for Processing, the following three main types of processing arrangements are identified:

1. Processing with imported materials where domestic entities import and purchase the materials, do some manufacturing domestically and sell abroad the finished products after processing. This form of processing may have correspondence with the contract producer under a factoryless arrangement (C) as discussed in Chapter 2 of the Guide;

2. Processing with supplied materials, where the domestic processors receive but do not purchase materials supplied and owned by foreign entities, process or assemble on order and charge only processing fees when returning the finished products (arrangement A);

3. Outward processing is the opposite of (2), foreign entities receive but do not purchase raw and supplemental materials, parts, components and semi-final products supplied and owned by Chinese entities, process or assemble on order and send the finished products to the same Chinese entities after processing.

The total exports and imports related to processing increased rapidly in the past decades. Comparing1981 and 2011 data for example, the total volume of goods sent for processing in 1981 was USD 2.5 billion, only 6 percent of total foreign trade of China. In 2011, the total volume of goods under processing amounted to USD 1306 billion, 36 percent of total foreign trade of China. Industrial processing is the main source of foreign trade surplus in China. Processing with imported materials dominates, while the ratio of processing with supplied materials decreased over time. Processing activities have extended from low value-added downstream manufacturing to more sophisticated upstream manufacturing, with domestic contribution increasing over time.

In China the Customs is the authority to disseminate goods for processing (GFP) exports and imports data. Applying the principles of BPM6 leads to the following classification of the above mentioned processing arrangements. Only processing with supplied materials (2) and outward processing (3) are in line with the manufacturing services without a change of ownership, while a substantial part of processing with imported materials should be reclassified from goods for processing to general merchandise under goods account in the balance of payments because changing of ownership on goods occurs. Based on Customs data, only net exports of processing can be derived, which in many cases do not equal to the service charges. Also, a complicating factor is that the Customs' classifications on foreign trade are different from those set in BPM6.

Data analysis and cross-check of inter-agency data in the so-called International Transaction Reporting System leads to improvements in the estimates of processing with imported materials, processing with supplied materials and outward processing. To some degree, this additional data analysis also enables the State Administration of Foreign Exchange to collect service fees of different types of GFP and improve the data quality in the future. Cross-border receipts and payments of processing with supplied materials and outward processing may be potential alternatives to the statistics on the relevant GFP by the Customs. This is because the former is in better position to meet BPM6 requirements. Furthermore, conceptually speaking, the difference between cross-border receipts and payments is Manufacturing Services on physical inputs owned by others. However, to get more accurate data, in-depth study on this issue should be made in the future.

Country Case Study 3

The 'Maquiladora' Industry Program in Mexico

The 'Maquiladora' Industry Program consisted of enterprises that, with the authorization of Mexico's Secretariat of Economy, temporarily imported goods for manufacturing, assembly or repair with the intention of subsequently exporting them. The 'Maquiladora' regulation was replaced by the IMMEX program in 2006. Enterprises under the Maquiladora regulation were exempt from the payment of duties and taxes if their finished products were sold abroad. The regulation began in the mid-1960s with the Policy for the Industrialization of the Northern Border and the purposes were promoting foreign direct investment, developing the manufacturing industry and creating employment.

Enterprises admitted to the Maquiladora Industry Program spread across Mexico, with the majority located in the north of Mexico, where they took advantage of the proximity of the United States. The Mexican authorities determined which goods in terms of their Harmonized System (HS) codes could be imported and exported. Any change in the registered and approved items was reported to the authorities for re-approval under new HS codes. Goods produced by the 'Maquiladora' industry could leave Mexico without any restriction on their destination. It was assumed that all goods temporarily imported by the 'Maquiladora' enterprises were goods for processing. These enterprises were delivering manufacturing services on inputs owned by others. Change of ownership was only recognized when the enterprise paid duties and taxes on the imported goods to sell the finished products to the domestic market. These transactions were identified by specific customs records.

The sources for the statistics on goods for processing until 2006 were the customs records used for the merchandise trade statistics and the monthly survey of the 'Maquiladora' Industry carried out by the National Institute of Statistics and Geography (INEGI). It was mandatory for the 'Maquiladora' enterprises to respond to the survey that asked about employment and salaries, purchases and consumption of goods and services as well as the value added of exports. The value added of exports corresponded with the processing fee since it was including the wages and salaries, domestic expenses and profits. The 2006 statistics showed that there were almost 3,000 'Maquiladora' enterprises employing 1.2 million persons and the total value of processing fees was USD $24 billion. With the start of the IMMEX Program the customs records changed. As a result there was no longer information available to distinguish the goods for processing and calculate the manufacturing services on inputs owned by others because the IMMEX Program involves different kind of enterprises, production processes and foreign trade transactions. This is why INEGI started collecting statistics for this new group of enterprises on merchandise trade by enterprise characteristics, including a linkage of customs records to obtain information on export market relationships, with a key focus on goods sent to Mexico for processing.

III. Merchanting (B)

64. The characteristics of merchanting are explained in Chapter 2 of the Guide. A trader engaged in Merchanting purchases goods from a foreign supplier and sells them subsequently to customers abroad. The goods do not physically enter the domestic territory of the trader, and the trader does not carry out substantial transformation on the goods.

65. According to the 1993 SNA and BPM5, the difference between the sale and purchase of goods under merchanting were recorded as merchanting services. The goods subject to merchanting remained unrecorded as imports and exports and this was

acknowledged in BPM5 as an exception to the change in ownership principle. The 2008 SNA and BPM6 are brought in line with this principle and the net export of goods under merchanting is shown in the accounts of the country in which the merchant is resident. These new accounting conventions do not alter the production account of the merchant as its output remains to reflect the trade margin.

66 The differences in recording are highlighted in Table 5.4 based on the athletics shoe example as introduced in Chapter 2 of the Guide. The key aspect of this change is that the transactions in goods are explicitly recorded and the trade service provided by the merchant is added to the value of the good sold under merchanting. Moving from the 1993 SNA (or BPM5) to the 2008 SNA (BPM6) basically resembles a shift from the recording of merchanting in terms of services to its recording in terms of goods. Distribution services are not measured independently within the balance of payments services account, because the value of the trade service is included in the value of the sale of the good.

Table 4
Merchanting, adjustments in international transactions, 1993 versus 2008 SNA

	SNA 1993	*SNA 2008*
Exports	**25**	**25**
Goods	0	25
Net exports of goods under merchanting	0	25
Goods acquired under merchanting	0	-85
Goods sold under merchanting	0	110
Services	25	0
Imports	**0**	**0**

67. With regard to merchanting, the following data items, and corresponding data adjustments, are required:

(a) Estimate of the trade service of the merchant;

(b) Estimate of the imports (or negative exports) and exports under merchanting;

(c) Estimate of (changes in) inventories held abroad.

68. Each of these items is further discussed below.

A. Identification of merchanting

69. As trade services related to merchanting are not necessarily identified as such, additional analysis is needed to identify cases of merchanting, also because merchanting related imports (or negative exports) and exports remain unobserved in merchandise trade statistics. The kind of investigations required are similar to those developed by NSIs to identify factoryless goods producers. These are later on discussed in this paper. The following examinations could be carried out to detect merchanting activities:

(a) Merchanting related transactions may be observed within the scope of business surveys, particularly the surveys for the wholesale industry, but this would require questionnaire adjustments as noted below;

(b) Data comparisons and analysis of different data sources, preferably on the basis of single company identification numbers, particularly (but not necessarily only) in the Trade Section G, that carry out international transactions (as far as observed);

(c) Detailed banking data on transactions in foreign currency classified as exports of goods could be compared with customs data on exports for individual enterprises. Whenever banking data on exports of goods for an enterprise are significantly higher than customs data, it may be suspected that there is a case of merchanting and further data analysis (or surveying) is recommended;

(d) Alternatively, a method used to find cases of merchanting is the comparison of data for enterprises covered in business surveys with customs data. Business surveys may help identify trade related transactions with foreign suppliers or customers.

1. Estimate of the trade service of the merchant

70. Information on trade margins is typically obtained from business surveys, though there may, or may not, be a split for merchanting versus other sales. Merchants will usually be classified under Section G (Wholesale and retail trade; repair of motor vehicles and motorcycles) of ISIC Rev.4. It should be noted that enterprises in other industry branches are engaged in merchanting as well.

71. The business surveys for companies in the wholesale and retail trade section are usually designed to measure the turnover from distributive trade, as well as purchases of goods which are subject to distributive trade. This information will allow compilers to estimate the trade margins of wholesale and retail trade as the difference between trade related purchases and sales (turnover).

72. In the production account, the output of distributive trade (the trade margin) is recorded as all sales made by the unit irrespective of the location of where the good is purchased. Supplementary questions in the survey address the merchanting portion of trade related activities, following a structure is proposed below:

(a) Goods purchased abroad, which are sold domestically or abroad;

(b) Goods sold abroad, which were purchased domestically or abroad;.

(c) Changes in inventories as a result of timing differences between (a) and (b).

73. The merchanting related purchases of goods are represented by item (a.ii.) while merchanting related sales are represented by item (b.ii.). The difference between the two may include the trade service but also possible holding gains and losses resulting from revaluations of goods subject to merchanting which should be removed from the value of trade services.

74. Another source of information on merchanting services may be the international trade in services statistics. The Manual on Statistics of International Trade in Services 2010 indicates that valuing of the service provided by commission agents, wholesalers and retailers (distribution services) would present a particularly useful complement to services statistics covered in the balance of payments. It is possible that some of the revenues from merchanting are already observed in the trade in services statistics. Estimating and providing this information on a complementary basis, excluding holding gains and losses, would enable a more complete analysis of the international supply of services.

Country Case Study 5.4

Surveys used in the US to identify merchanting and inventories held abroad

In the United States, a combination of information collected on various surveys is needed to appropriately record the transactions related to merchanting activities and the corresponding changes in inventories held abroad. Two separate agencies are responsible for the collection of the survey data. The Bureau of Economic Analysis (BEA) conducts mandatory surveys under a law known as the International Investment and Trade in Services Survey Act. Among its provisions, this act requires the periodic collection of data on international trade in services and direct-investment-related activities. The United States Census Bureau conducts the annual wholesale trade survey (AWTS) and the annual retail trade survey (ARTS) which collects information on sales (turnover) and inventories.

The BEA conducts the Benchmark Survey of Transactions in Selected Services and Intellectual Property Products with Foreign Persons (BE-120) to track U.S. imports and exports of services and intellectual property products. A U.S. corporation reports transactions for the fully consolidated U.S. domestic enterprise which excludes foreign branches and other foreign affiliates.

BPM6 recommends classifying merchanting as a component of trade in goods under the new category "net exports of goods under merchanting," and presenting the gross transactions in goods associated with merchanting. The BEA currently collects net receipts from merchanting on its surveys of selected services and records them as a component of "other" private services. BEA's current source data on goods do not cover gross transactions associated with merchanting because these goods do not cross the U.S. customs frontier. Therefore, BEA has added questions to its 2011 benchmark survey to identify the purchases and subsequent resales of goods under merchanting.

After contacting potential survey respondents, BEA determined that some respondents may have difficulty identifying these transactions in their accounting records and accurately reporting them. Therefore, BEA has requested information on the underlying goods transactions on a voluntary basis. BEA will evaluate the survey responses to determine if they can be used to develop estimates for these transactions.

The reporting unit on the Census Bureau's AWTS or ARTS survey cover all wholesale (or retail) establishments in the United States reporting payroll under a single employer identification number (EIN). The EIN is a Federal Tax Identification Number, and is used to identify a business entity. The end-of-year inventories and inventories held outside the U.S. are collected by industry and not by type of product. Below is an excerpt from the annual wholesale trade survey for the questions specific to inventories. The same questions appear on the ARTS survey.

The questions do not specifically target goods bought and sold under a merchanting arrangements. The data collected could reflect timing differences of when a good is imported into the U.S. and when the change in ownership occurs. However, the data could be used as an indication of the amount of inventories held abroad under merchanting arrangments. The highest percentage of inventories held abroad for merchant wholesalers excluding manufacturing sales branch offices was in the petroleum and products industry, an industry known for its merchanting type arrangements. The results also show that in the year 2011 inventories held abroad by merchant wholesalers represent 4 percent of total inventories.

2. Measuring net exports of goods under merchanting

75. One could say that, compared to industrial processing, merchanting leads to the opposite data situation. Industrial processing results in flows of goods in merchandise trade

statistics which should not be recorded in the balance of payments. Merchanting leads to net exports (exports minus imports) which remain unobserved in merchandise trade statistics. This means that supplementary sources are needed for their observation.

76. As previously discussed, the transactions of goods under merchanting could either be observed by making corresponding adjustments in the business statistics of wholesale traders, or in the international trade in services statistics. The minimum data requirement is to measure at least the trade margin obtained from merchanting. Without information on product transactions, the corresponding product values (purchases and sales) could roughly be derived from the trade service value by making assumptions, however details on the specific commodity categories will remain unknown. Information on the trade service alone would probably provide a reasonable approximation of the contribution of merchanting to the trade balance. This approximation of imports and exports is obviously a second best alternative that should only be used when the data collection cannot be expanded in the process of moving from BPM5 to BPM6.

3. Estimate (changes in) inventories held abroad

77. The above presented country case study (5.4) shows that inventories held abroad as part of merchanting should be observed by making the appropriate arrangements in the business surveys of wholesale traders. In connection with information on purchases and sales of goods under merchanting, the business survey may be able to provide a comprehensive view of merchanting activities and may support making the distinction between trade services and revaluations of related inventories.

4. Data validation

78. Cases of merchanting which are significantly contributing to (trade related) domestic turnover, or are significant from a balance of trade perspective, may require an individual approach on the basis of all available information that is collected for these companies. This may lead to data improvements and filling in the missing bits of the entire merchanting arrangement. An example of such a custom-made analysis is illustrated in the following country case study of Kyrgyzstan.

Country Case Study 5.5
Merchanting in Kyrgyzstan

Like most countries in the world, Kyrgyzstan is caught up by the process of globalization. International flows of goods, services, capital, labour and income, affect the national economy and -(pose challenges for the statistical measurement?). The National Statistical Committee of the Kyrgyz Republic (NSC) is responsible for detecting new phenomena accurately and developing measurement solutions.

Regular statistical reporting does not distinctly show the effects of globalization in the activity of national enterprises. In order to detect aspects of global production, an analytical tool was developed and put into practice in 2010 by the NSC. This tool deals mostly with the data of wholesale trade enterprises. While processing regular statistical reports, an automatic comparison is conducted regarding domestic wholesale trade volumes, volumes of production, and exports and imports by products. These quasi balances provide current estimations at the level of product groups. The tool enabled the NSC to discover some important facts.

There are two large resident enterprises in Kyrgyzstan which occupy a significant place in the national economy. The revenues of these enterprises in 2011 were equal to 0.7 % and 0.4% of GDP respectively. These enterprises are monitored through several indicators

within regular statistical reporting: gross income (trade margin), goods for resale, expenditures on heat supply and electricity, railway transport, communication, rent, payments of interest on credit, compensation of employees, travel allowances and other expenditures. These indicators reflect the domestic production activities carried out by these companies as recorded in the Kyrgyzstan national accounts.

Most of these enterprises' activities consist of wholesale trade in oil products. A specific feature is that these enterprises buy oil products in Russia which are sold in Kazakhstan. The goods (oil products) are being shipped from Russia to Kazakhstan directly without entering the economic territory of Kyrgyzstan. This trade in oil products remains unrecorded in the customs statistics and, consequently, they do not show up in the foreign trade statistics of Kyrgyzstan.

At the same time, the sales of these oil products are reported by these enterprises as wholesale turnover of domestic trade. Although this turnover is correctly assigned to these two companies, it does not relate to domestic trade de-facto as the oil products do not enter the national territory. Taking into account that Kyrgyzstan is a country with a small market for oil products, the volumes under consideration are quite important regarding the scale of the national economy. The resulting misbalance between the data on trade in the domestic and foreign economies, intermediate consumption, and all other data in the input-output framework required reconsideration.

The Interstate Statistical Committee of the Commonwealth of Independent States (CIS-STAT) experts together with the NSC statisticians considered the question of how the activity of the described enterprises should be reflected within the compilation of Kyrgyzstan national accounts and the following solution was adopted. Recognising these clear cases of merchanting, the corresponding recommendations in the 2008 SNA (14.79, 26.21) and BPM6 (10.41-10.49), as well as the recommendations in the Guide "The Impact of Globalization on National Accounts" (6.22-6.23) were applied. This means that the acquisition of goods by these two merchants is shown as a negative export of goods under merchanting while the the subsequent sales of the goods id shown as positive export of goods under merchanting. The difference between sales and purchases of merchanted goods represents the "net exports of goods under merchanting" which equals the produced trade services by these two merchants in Kyrgyzstan.